Installation Instructions

Sensus Tamper Loop Feature

Introduction

The Tamper Loop feature was designed for use with the Sensus PhonRead® system Meter Interface Unit (MIU) to indicate that possible tampering had occurred at the meter location. The Loop feature is built into the MIU. When properly installed, the Tamper Loop wiring is checked for wiring continuity approximately every 15 minutes by the MIU. If possible tampering of the loop is detected the MIU calls into the utility office immediately via the emergency phone number programmed into the MIU. Based on utility policy, appropriate action is taken.

The following Tamper Loop installation instructions provide for the minimum requirements for a successful installation. This installation instruction document is only for installation of the Tamper Loop feature. For instructions on installing other AMR devices, please request and refer to the individual installation instructions for those devices.
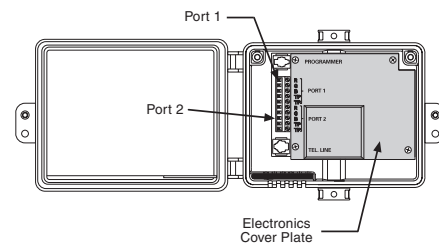
Installation Tools and Materials

- Screwdriver - Small standard head for terminal screws
- Wire cutter and stripper
- Wire stapler
- 2-conductor solid wire for Tamper Loop wiring only (Sensus spec)
- 5-conductor wire minimum for combined Tamper Loop wiring and absolute encoder wiring - Sensus spec (Optional)
- Plastic coated (jacketed) seal wire
- 3M UY-2 gel cap wire connectors
- MIU Programmer, module and cable (Sensus 3000 series SSI)
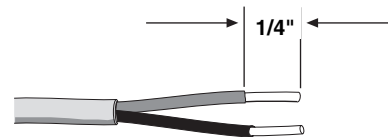- MIU Programming software

Installation

1. Based upon the MIU installation instructions, the following recommended installation guidelines should be considered for an actual MIU installation:

   a. placement which is accessible to both utility meter and intended customer's telephone line access — and the telephone line is working

   b. recommend inside installation (outside permitted) away from excessive amounts of heat and moisture. (Pit installations not recommended.)

   c. consider convenience of homeowner

   d. room for installation and future access

   e. consideration for optional TouchRead® TouchPad installation if being used

2. Install MIU at selected location and wire to encoder and phone line according to MIU installation instructions. (Sensus installation bulletin AMR-971R1)

3. The Tamper Loop feature does not require any additional hardware for installation. The "loop" is simply a wire passed through the tamper location. The wire is connected to a port on the MIU using the green and black terminal connections of the port. The proper port is the one that will be programmed by the MIU Programmer for use with "Tamper Loop" feature. This is usually Port 2 of the MIU which is used here for illustration purposes.
See diagram A.

Diagram A

Port 1
Port 2
Electronics Cover Plate

4. To make a proper wire connection to the MIU terminal, strip the wire jacket approximately 1/4" from the wire end, exposing bare wire for each of the color wires being used. *See illustration below.*

1/4"

If the MIU is located near the meter installation, a single plastic coated seal wire can be used to create the continuity loop of the Tamper Loop feature.

If the MIU is a further distance away from the meter, a separate wire connection is recommended. This separate wire connection can be part of a multi-conductor wire that is used to connect the meter encoder to the MIU or a separate two-conductor wire that can be installed to the meter location. In either event, the Tamper Loop feature installation is the same.

Installation Instructions
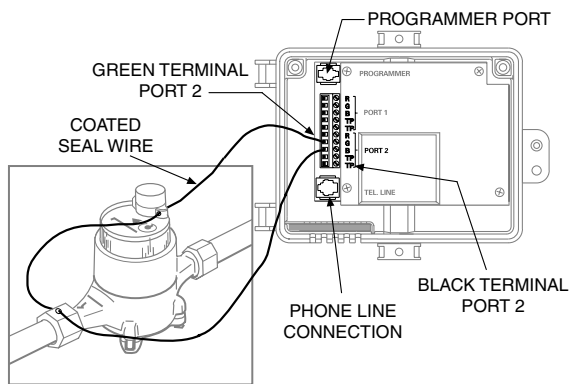
Sensus Tamper Loop Feature

5. Follow the step below to connect the continuity loop.

5A. For a single wire connection:

    a. Connect one end of the single plastic coated seal wire to the black "B" wire of the MIU port being used. The end of the plastic coated seal wire should be stripped per the instructions in point 4, above.

    b. Run the plastic coated seal wire through the desired tamper location (i.e.— meter connection nut, register seal hole, meter cap screw, etc.) and back to the MIU.

       NOTE: Be sure not to make a cut in the plastic coat of the seal wire or you will receive a false tamper loop indication on the PhonRead software. See diagram B below.
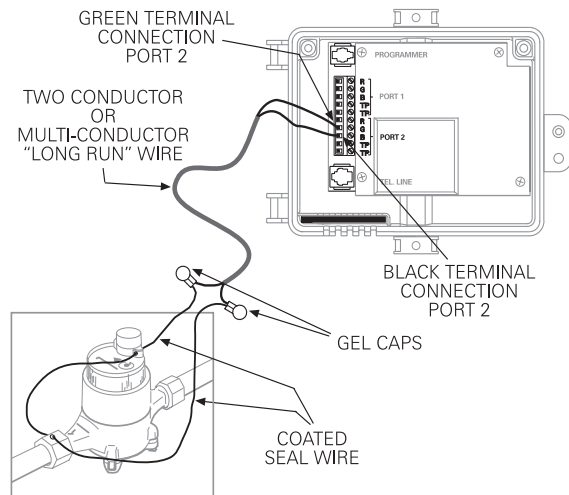
Diagram B

    c. Connect the other end of the single plastic coated seal wire to the green "G" terminal of the MIU port being used. The end of the plastic coated seal wire should be stripped per the instructions in item #4, above.

    d. This completes the tamper loop connection. Proceed to the Testing section on the next page.

5B. For a separate wire (long run) connection:

    a. For a long run connection you need a separate length of two-conductor wire or an extra "pair" of wires in a multi-conductor length of wire. This long run of wire must run from the MIU to the tamper detect location.

    b. Connect one end of the two-conductor wire or one of the pair of wires of the multi-conductor wire to the black "B" terminal of the MIU port being used. The ends of the wires should be stripped per the instructions in item #4, above.

    c. At the other end of the long run of wire connect the plastic coated seal wire to the same color of the two-conductor or multi-conductor wire that is connected to the Black "B" terminal of the MIU port being used. It is recommended that you use a 3M UY-2 gel-cap connector to connect the wires. Unlike the wire ends used for insertion into the MIU port terminals, the ends of the wires need not be stripped to use with the gel-cap connector.

    d. Run the plastic coated seal wire through the desired tamper location (i.e.— meter connection nut, register seal hole, meter cap screw, etc.) and back to the long run of wire.

       NOTE: Be sure not to make a cut in the plastic coat of the seal wire or you will receive a false tamper loop indication on the PhonRead software. See diagram C.
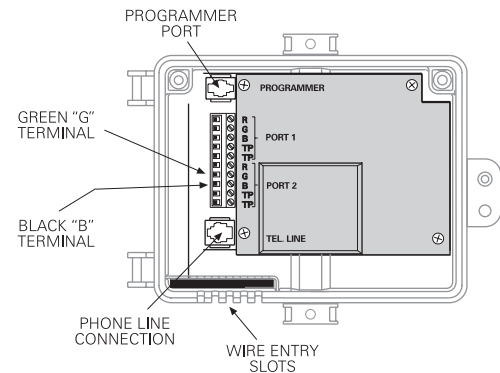
Diagram C

Installation Instructions

Sensus Tamper Loop Feature

e. Now connect the end of the plastic coated seal wire to the other open wire of the two-conductor wire or an open wire of the multi-conductor wire. It is recommended that you use a 3M UY-2 gel-cap connector to connect the wires. The ends of the wires need not be stripped to use with the gel-cap connector. This completes the continuity loop at the desired tamper location.

f. Back at the MIU complete the tamper loop connection by connecting the other wire of the two-conductor wire to the green "G" MIU terminal strip; or if using multi-conductor wire, connect the same color wire that was used at the tamper location to connect to the green "G" connection of the MIU terminal strip.

g. This completes the tamper loop connection. Proceed to Testing section.

Testing

After installing the Tamper Loop feature, the operation of the feature can be tested as follows:

a. Use an Sensus Solid State Interrogator (SSI) that has been loaded with the MIU programming software module.

b. Connect the SSI to the MIU programming port using the MIU programming cable. For detailed instructions on using the SSI to program an MIU, refer to the SSI Programming User's Manual, literature #AMR-986.

c. You will be using the MIU Commands feature of the SSI to check the port to which the Tamper Loop feature is installed.

These instructions are located on pages 3-11 to 3-14 of the SSI Programming User's Manual.

d. At the first view screen of the SSI in MIU programming mode, press the **"Shift"** key, then the **"Sensus Logo"** key. This will bring up programming options **"1-Edit Defaults"** and **"2-MIU Commands"**.Select **"2-MIU Commands"**.

e. A list of commands will display on the SSI screen. Using the arrow keys, scroll down to the **"Clear Tamper"** key command. Enter the port number to which the Tamper Loop is connected and press the **"Enter"** key. The response on the SSI screen should be **"Tamper Loop Tamper Okay"**.

f. A list of commands will again display on the SSI screen. Using the arrow keys, scroll up to the **"Read Data from Port"** command. Enter the port number to which the Tamper Detect Module is connected and press the **"Enter"** key. The response on the SSI screen should be **"Tamper OK"**.

g. If the proper response is received, verify the tamper data from the port again. If the response is correct, complete the installation for the MIU as described in the SSI programming manual and on the MIU Installation Instructions, literature #AMR-971R1).

Troubleshooting

1. *If no response from MIU port:*
After checking the **"Read Data from Port"** command you receive no response. Check the wiring connection of the Tamper Loop. After verifying that all connections are correct, attempt to read the port again. If successful, complete MIU installation. If unsuccessful, check the connections of the Tamper Loop wiring and that no bare wires are present along the loop including places where it feeds through the seal wire holes.

2. *If response from MIU is* **"Tamper Detected"***:*
After checking the **"Read Data from Port"** command and the SSI screen displays **"Tamper Loop Tamper Detected"**, the Tamper Loop will need to be reset. Using the MIU Commands of the SSI, scroll down the list of commands to the **"Clear Tamper"** command. Press the **"Enter"** key on the SSI to clear the tamper indication. Repeat the **"Read Data from Port"** command. If response is **"Tamper Loop Tamper OK"**, complete MIU installation. If **"Tamper Loop Tamper Detected"** is again displayed, attempt to clear tamper again. If unsuccessful, try using another Tamper Loop wire and recheck connections.

3. *To clear* **"Tamper Detect"** *indication after MIU installation:*
Once installed, the MIU will call into the PhonRead system software on schedule. If tamper has been detected at a Tamper Loop feature installation, there will be an indication on the PhonRead system software. To clear the tamper indication, a site visit must be made to the MIU installation. An SSI in MIU programming mode is required.

To clear the tamper indication, follow the instructions above in Step 2 of this Troubleshooting section. The tamper mode should also be verified that it is in the "enabled" mode.

Installation Instructions